BY **ELIZABETH WRAY** PHOTOGRAPHS BY **ANDY RYAN**

OUT OF THE TUNNEL, INTO THE LIGHT

A luminous new bridge over the Charles River connects the "Big Dig" to Boston city pride

BRIDGES ARE BORN to be praised in poems and songs. Whether massive and brawny or slender and lyrical, they earn our gratitude and admiration by offering us passage and connecting our worlds. The most beautiful among them stand as defining monuments to the cities they grace: New York, Venice, San Francisco, Boston.

Yes, the reigning bridge of the moment, one that the world's top bridge designers make pilgrimages to see, is in Boston, heretofore known for its undergraduates, Tea Party, baked beans, and traffic jams. The Leonard P. Zakim Bunker Hill Bridge floats above the Charles River in ethereal splendor. Spun of spidery white cables draping twin towers, it offers a panoply of visions to its beholders: a two-masted schooner, ballerinas dancing, egrets preparing to take flight.

The bridge joins the city's 17th century beginnings in Charlestown to a 21st century global city that runs on the triple engines of high tech, medical research, and world-class universities. And, as the bridge at the end of the tunnel—in this case, Boston's Central Artery/Tunnel, also known as the "Big Dig"—it has bridged the murky waters of controversy to replace skepticism with civic pride.

The bridge is part of the Big Dig, the largest overall highway construction project in the United States. Bechtel has been overseeing the project for the past 15 years in a joint-venture with New York-based civil design firm Parsons Brinckerhoff. The Big Dig, which will reunite the city's historic waterfront with its downtown commercial and financial districts, replaces a 50-year-old elevated highway system and promises relief from traffic gridlock.

The new bridge is the first flowering of the underground superhighway and, according to Resident Engineer Al MacPhail of Bechtel, it may well be responsible for turning the tide of public opinion in favor of the entire Big Dig project, which in many ways has affected the people of Boston for 10 years.

"We made sure to sell the bridge to the community from the very first day of construction," MacPhail says. "I must have met with a hundred yacht clubs, service clubs, and community groups. Basically, I just told them what I believe: One day Boston will be known for this bridge." MacPhail could afford to speak with authority. He knew he had a visionary design and the best possible construction team.

The bridge would replace a rusting, six-lane, traffic-

PROJECT PROFILE

LOCATION

Boston, Massachusetts

CUSTOMER

Massachusetts Turnpike Authority

PARTICIPANTS

Joint venture with Parsons Brinckerhoff

DESCRIPTION

444-meter-long cable-stayed bridge that delivers traffic emerging from the new Central Artery tunnel under downtown Boston across the Charles River to connect to Charlestown and Boston's North End

SCOPE OF WORK

Engineering and project management

VALUE

$105 million

SCHEDULE

1997 - 2001

jammed, double-decker eyesore. It was begging to be built and yet had been continuously conceived and reconceived in scores of rejected plans, threatened with a lawsuit by the city of Cambridge, and nearly abandoned due to public outcry to do away with it in favor of a tunnel.

Luckily for all, and at the eleventh hour, Swiss bridge designer Christian Menn won approval for his willowy cable-stayed bridge, a design that ties cables from the roadbed directly to the support towers. Uncommon in the United States, the style became popular in Europe after World War II, when it proved to be a good, economical replacement for bombed-out crossings.

Menn's Boston interpretation of the cable-stayed bridge was graceful, contemporary, and unlike any other. Asymmetrical, it carries two outer lanes cantilevered on its east side. An additional eight lanes pass through the legs of the twin 91-meter, obelisk-topped, inverted-Y towers that echo the nearby Bunker Hill Monument. The 10-lane, 56-meter-wide structure—the widest cable-stayed bridge ever built—will pick up Interstate 93 traffic as it emerges from the new Central Artery tunnel and carry it across the Charles River to points north.

It's a bridge with something for everyone, even the fish that benefit from the large semicircular holes cut at six-meter intervals along the edge of its roadbed, allowing sunlight to break up the shadow on the water below.

Some of Menn's design innovations grew out of construction challenges. Although the cables connecting the towers to the main span attached to the outside of the roadway, this was not possible at either end. "We just didn't have the room to connect them that way on the back spans because of the close proximity of the old bridge," says MacPhail. "So we put a single strand of cables down the middle of the road. The effect added to the overall delicate beauty of the bridge."

Despite the construction complexities, the bridge's design is simple. "It all comes down to balance," MacPhail says. "It gets a little complex when you figure in the eccentricity of the cantilevered lanes, but that's part of the balancing act."

As MacPhail predicted, Boston is already becoming known for its new bridge. Atlanta and other cities have requested similar designs. With construction finished, the bridge must wait until sections of the Big Dig are completed in the fall of 2002 before it can carry motorists. Until then, the bridge will be patched, coated, and studded with white and sapphire-blue lights for evening shimmer, hovering over the Charles like a resplendent vision, a kinetic monument in the making.

What's in a Name?

Bridges, like movie stars and war heroes, eventually find their true names. Norma Jean Baker became *Marilyn Monroe* and Dwight David Eisenhower *Ike*. Sometimes they're lucky enough to be born with a name to aspire to—take any number of Parisian or Venetian bridges: *Pont du Carrousel* or *Ponte dei Sospiri,* the bridge of sighs. More often, people coin nicknames from long formal appellations; The San Francisco-Oakland Bay Bridge is known simply as the *Bay Bridge*.

During its construction, the new Boston bridge was referred to as the *Charles River Bridge,* or, even more familiarly by construction workers and neighborhood friends, as the *Al MacPhail Bridge* after the Bechtel veteran who was the project's popular and public-spirited resident engineer. When the time came to formally name the bridge, the Massachusetts Turnpike Authority considered all kinds of names—from neighborhoods to historic sites to famous people. One sardonic group of baseball fans, noting the wide stance of the bridge's towers, even suggested naming it after Bill Buckner, the Red Sox first baseman who lost the 1986 World Series by letting a ground ball slip between his legs.

The bridge was finally given a politically correct compound name, the *Leonard P. Zakim Bunker Hill Bridge,* from the name of a civil rights leader and a Revolutionary War battle that the colonists lost.